a field transformer operable to increase intensity of a field directly affecting the velocity of the wave propagation within the channel, as compared to the external field intensity, according to a known proportion, said field transformer comprising a metal element having a part thereof formed with a sharp edge, the field transformer serving as a concentrator of the external field, which is to be detected, within the delay line, when said metal plate is located in said spot so as to extend predominantly along the external field, and said sharp edge is located in the close vicinity of the delay line.--

B6 cont'd

REMARKS

Claims 1-31 and 33-40 are pending. By this Amendment and the attached Request for Approval of Drawing Corrections, the specification, Figure 1 and claims 1, 7, 11 and 13 have been amended and claims 38-40 have been added. Claims 1, 7, 11 and 13 have been amended solely to more clearly recite the subject matter of the claimed invention. Figure 1 has been amended solely to include reference numeral 13 which is mentioned in the specification. The specification has been amended to more explicitly recite what is generally known. No new matter has been added. Reconsideration in view of the above amendments and following remarks is respectfully requested.

The attached Appendix includes a marked-up copy of each rewritten paragraph (37 C.F.R. §1.121(b)(1)(iii) and claim (37 C.F.R. §1.121(c)(1)(ii)).

Applicants appreciate the Examiner's indication that claims 7 and 21-31 contain allowable subject matter if rewritten to overcome the rejection under 35 U.S.C. §112, 2nd paragraph. Accordingly, Applicants have added claims 38-40 which recite all the features of claims 7, 9 and 10, as well as all the features of the claims from which they depended from, respectively. Thus, it is respectfully asserted that claims 38-40 are allowable. Further, for the reasons discussed below, Applicants respectfully assert that all other pending claims are allowable.

Claims 7 and 21-31 are rejected under 35 U.S.C. §112, 2nd paragraph, for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Page 2 of the Office Action states that it is not understood from the specification or the Figures how "said additional (or second) wave channel is screened from said external field" in claims 7 and 21. The rejection is respectfully traversed.

Applicants respectfully assert that a technique of screening a space region from an external field is generally known in the art. Applicants respectfully assert that Figure 5 of Maier et al. (hereinafter "Maier"), U.S. Patent No. 5,966,008 represents one example in which an outer conductor (31) is insulated from the inner conductor (32) (col. 6, lines 25-30). In addition, Applicants respectfully assert that it is generally known in the principles of electrodynamics and electrical engineering that a screened space region is a region defended from the penetration of the electrical field force lines. This can be achieved by, for example, using a metallic surface, such as, an equipotential conductive screen. Therefore, Applicants respectfully assert that a screening means does not need to be explicitly illustrated. Further, Applicants respectfully assert that the difference between the two wave channels is described, at least, on page 22, lines 12-24 of the specification, as being, respectively, the "exposed to" and "screened from" the external field. The unscreened and screened channels are shown on the same structure to illustrate that they communicate with the same receiving-emitting antenna (56 in Figure 3; page 22, lines 9-11). Accordingly, Applicants respectfully assert that it would have been obvious to one skilled in the art at the time of the invention as to how said additional (or second) wave channel is screened from said external field as recited in claims 7 and 21. It is respectfully requested the rejection be withdrawn.

Claims 1, 3-5, 12, 13, 15, 16, 18, 19 and 33-37 are rejected under 35 U.S.C. §102(b) as being anticipated by Maier, claims 6, 8, 11 and 20 are rejected under 35 U.S.C. §102(b) as anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious, over Maier and

claim 17 is rejected under 35 U.S.C. §103(a) over Maier. The rejections are respectfully traversed.

Applicants respectfully submit that Maier fails to, at least, teach, disclose or suggest a sensor for use in a device for non-contact detection of an external field by positioning the sensor at a spot where the external field is to be detected, the sensor comprising a delay line, which is exposed contactlessly to action of the external field and comprises a transducer arrangement that is provided on a substrate made of a material capable of transporting therethrough a wave sensitive to said external field, and defines a wave channel for the wave propagation through the substrate exposed to the external field so as to be directly affected by the external field, the transducer arrangement being capable of being actuated by an interrogation signal to generate the wave propagating through the wave channel and capable of converting the wave into an output response signal, said external field affecting a change in a velocity of the wave propagation through the substrate, said output response signal being thereby informative of said external field, as recited in claim 1 and as similarly recited in claims 11 and 13.

Applicants submit that claims 1, 11 and 13 are, at least, advantageous by providing a sensor which directly detects the external field by the surface acoustic wave structure (the substrate and transducer arrangement).

Instead, Applicants respectfully assert that Maier discloses a sensing element, which is composed of a soft iron ring (3) with an air gap, in order to obtain a defined channeling of the magnetic field (M) in the region of the sensor (col. 4, lines 3-9) and a magnetoresistor (12), i.e., material with the resistance depending on the value of the magnetic field, is disposed as a magneto-resistive element in an active region of the ring (3). In addition, Maier discloses a sensing element composed of a toridal core (103), made of ferromagnetic material, on which there is a toroidal-core winding (104) (col. 5, lines 38-44). Two terminals (a and b) of the winding (104) are connected to a voltage-dependent impedance (VDX), which is connected in parallel with these terminals (col. 5, lines 45-47). In the device

disclosed in Maier, the winding (104) along with the terminals (a and b) form a magnetosensitive element which constitutes the terminating impedance to be connected to the surface-wave transducer (col. 5, lines 47-52). The surface-wave configuration 21, of Maier, is connected to the sensing element through electrodes (transducers) and serves solely for converting a signal from the sensing element indicative of the changes in its resistance (i.e., it is an indicator of changes occurring in the magnetosensitive element in response to the external field). Thus, in contrast to Applicants' claims 1, 11 and 13, the surface-wave configuration (21) of Maier does not directly detect the external field because the signal is actually sensed by the sensing element of the device. Therefore, Applicants respectfully submit that Maier fails to teach, disclose or suggest a substrate which defines a wave channel for the wave propagation through the substrate exposed to the external field so as to be directly affected by the external field as recited in Applicants' claims 1, 11 and 13.

In addition, Applicants submit that a typical transducer of surface acoustic waves is a multiterminal circuit which contains both electric and acoustic (mechanical) terminals. Therefore, the transducer response can be tuned through its electric terminals, as disclosed in the device disclosed in Maier, wherein a magnetosensitive resistor is connected to the electrical terminals of the transducer. On the other hand, the transducer of Applicants' claims 1, 11 and 13, is tuned through its acoustic terminals by changing the surface wave velocity, as disclosed in claims 1, 11 and 13.

Further, with regard to claims 8, 11 and 20, Applicants respectfully assert that Maier fails to teach, disclose or suggest a field transformer operable to concentrate the external field of a given voltage to thereby produce an increased intensity of the field within the delay line exposed to an increased intensity field in a known proportion, the increased intensity field directly affecting a velocity of the wave propagating within the delay line as recited in claim 11 and as similarly recited in claims 8 and 20. Applicants respectfully assert that claims 8, 11

and 20 are, at least, advantageous by providing a transformer which increases the intensity of the electric field influencing the surface acoustic wave propogation. Applicants submit that no where in Maier is it taught or suggested to use a transformer to increase the intensity of the electric field as disclosed in Applicants' claims 8, 11 and 20.

For at least these reasons, Applicants submit that Maier fails to teach, disclose or suggest all the features of Applicants' claims 1, 11 and 13 as well as all the features of claims 3-6, 8 and 12, which depend from claim 1, all the features of claims 15-19 and 34-37, which depend from claim 13. It is respectfully requested the rejections be withdrawn.

Claims 2 and 14 are rejected under 35 U.S.C. §103(a) over Maier in view of Ruigrok, U.S. Patent No. 6,278,588. The rejection is respectfully traversed.

Applicants respectfully submit that the combination of Maier and Ruigrok fails to teach, disclose or suggest all the features of claims 2 and 14 because Ruigrok fails to overcome the deficiencies of Maier as discussed above with regard to claims 1 and 13, from which claims 2 and 14 respectively depend. It is respectfully requested the rejection be withdrawn.

In view of the foregoing amendments and remarks, Applicants submit that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1-31 and 33-40 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in better condition for allowance, the Examiner is invited to contact Applicants' undersigned attorney at the telephone number set forth below.

Respectfully submitted,

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Attachments:
- Appendix
- Request for Approval of Drawing Corrections
- Petition for Extension of Time
- Amendment Transmittal

Date: August 19, 2002

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DEPOSIT ACCOUNT USE AUTHORIZATION
Please grant any extension necessary for entry;
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APPENDIX

Changes to Specification:

Page 22, lines 4-11:

Thus, the sensor 50 comprises a first acoustic channel 52 that is formed in the substrate between a pair of transducers 51, 53 and is contactlessly exposed to the external electric field. An additional acoustic channel 54 is created in the substrate between a pair of additional transducers 55, 57, and is screened (together with the transducers 55, 57) from the external field, so that its delay time is independent from the external field intensity. The screening of the additional acoustic channel 54, which is to be defended from the penetration of the electrical/magnetic filed force lines, can be implemented by using any suitable known means. For example, a metallic surface which presents an equipotential conductive screen can be used. The sensor 50 is provided with a receiving-emitting antenna 56 for communicating with both acoustic channels 52 and 54 via their buses.

Changes to Claims:

Claims 38-40 are added.

The following is a marked-up version of each amended claim:

1. (Amended) A sensor for use in a device for non-contact detection of an external field by positioning the sensor at a spot where the external field is to be detected, the sensor comprising a delay line, which is to be exposed contactlessly to action of the external field and comprises:

a transducer arrangement that is provided on a substrate made of a material capable of transporting therethrough a wave sensitive to said external field, and defines a wave channel for the wave propagation through the substrate exposed to the external field so as to be directly affected by the external field, the transducer arrangement being capable of being actuated by an interrogation signal to generate ~~said~~ the wave

propagating through the wave channel and capable of converting the wave into an output response signal, said external field affecting a change in a velocity of the wave propagation through the substrate, said output response signal being thereby informative of said -external field.

7. (Amended) The sensor according to Claim 1, ~~and~~ also comprising an additional delay line formed by an additional transducer arrangement defining an additional wave channel, wherein said additional wave channel is screened from said external field and has a propagation length ~~of the wave channels being~~ different from that of the additional wave channel, said output response signal being a vector sum of output signals of the two wave channels.

11. (Amended) A sensor for use in a device for non-contact detection of an external field in the vicinity of an electric wire, the sensor comprising:

-a substrate carrying a delay line formed by a transducer arrangement on the substrate to define a wave channel for the wave propagation through the substrate;~~,~~ and

-a field transformer operable to concentrate the external field of a given voltage to thereby produce an increased intensity of ~~a~~the field within ~~a~~the delay line exposed to an increased intensity field~~, as compared to the intensity of the external field in the vicinity of the wire outside the delay line,~~ in a known proportion, the ~~increased~~increased intensity field directly affecting a velocity of the wave propagating within the delay line; wherein -the ~~delay line comprising a~~ transducer arrangement is capable of being actuated by an interrogation signal to generate said wave propagating through the wave channel and capable of converting the wave into an output response signal, said wave channel being exposed contactlessly to action of the increased intensity field created by said field

transformer and proportional to the external field to be measured, which effects a change in athe velocity of the wave propagation through the substrate, said output response signal produced by the passive unit being thereby informative of said external field.

13. (Amended) A device for non-contact detection of an external field, comprising:

-active and passive units, wherein the passive unit is to be positioned at a spot where the external field is to be detected, and the active unit is operable to emit an interrogation signal to be received at the passive unit, receive an output response signal coming from the passive unit, and process said output response signal for determining and indicating the external field, the passive unit comprising:

-a substrate to be exposed to the external field so as to be directly affected by the external field, the substrate being made of a material capable of transporting therethrough a wave sensitive to said external field;, and

-a delay line provided on said substrate to define a wave channel for the wave propagation through the substrate exposed to the external field, the delay line comprising a transducer arrangement capable of being actuated by said interrogation signal to generate said wave propagating through the wave channel and capable of converting the wave into said output response signal, said wave channel being exposed contactlessly to action of the external field, which effects a change in a velocity of the wave propagation, said output response signal produced by the passive unit being thereby informative of said external field.